

MOS FIELD EFFECT TRANSISTOR μ PA1855

N-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR SWITCHING

DESCRIPTION

The μ PA1855 is a switching device which can be driven directly by a 2.5 V power source.

The μ PA1855 features a low on-state resistance and excellent switching characteristics, and is suitable for applications such as power switch of portable machine and so on.

FEATURES

- Can be driven by a 2.5 V power source
- · Low on-state resistance

RDS(on)1 = 23 m Ω MAX. (VGS = 4.5 V, ID = 3.0 A)

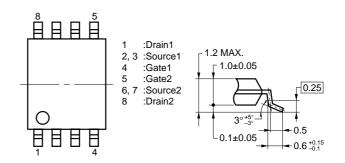
 $R_{DS(on)2} = 24 \text{ m}\Omega \text{ MAX.} \text{ (Vgs} = 4.0 \text{ V, Ip} = 3.0 \text{ A)}$

 $R_{DS(on)3} = 29 \text{ m}\Omega \text{ MAX.} \text{ (Vgs} = 2.5 \text{ V, Ip} = 3.0 \text{ A)}$

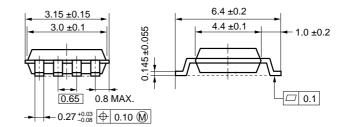
• Built-in G-S protection diode against ESD

ORDERING INFORMATION

PART NUMBER	PACKAGE
μPA1855GR-9JG	Power TSSOP8



PACKAGE DRAWING (Unit: mm)



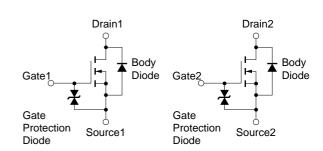
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage	Voss	20	V
Gate to Source Voltage	Vgss	±12	V
Drain Current (DC)	ID(DC)	±6.0	Α
Drain Current (pulse) Note1	D(pulse)	±24	Α
Total Power Dissipation Note2	PT	2.0	W
Channel Temperature	Tch	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C

Notes 1. PW \leq 10 μ s, Duty Cycle \leq 1 %

2. Mounted on ceramic substrate of 5000 mm² x 1.1 mm

EQUIVALENT CIRCUIT



2. Mounted on Ceramic Substrate of 3000 min X 1.1 min

Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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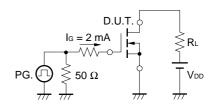
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-off Current	IDSS	V _{DS} = 20 V, V _{GS} = 0 V			10	μΑ
Gate Leakage Current	Igss	Vgs = ±12 V, Vps = 0 V			±10	μΑ
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	0.5	1.0	1.5	V
Forward Transfer Admittance	yfs	V _{DS} = 10 V, I _D = 3.0 A	1	13.3		S
Drain to Source On-state Resistance	RDS(on)1	Vgs = 4.5 V, ID = 3.0 A		17	23	mΩ
	RDS(on)2	Vgs = 4.0 V, ID = 3.0 A		18	24	mΩ
	RDS(on)3	Vgs = 2.5 V, ID = 3.0 A		22	29	mΩ
Input Capacitance	Ciss	V _{DS} = 10 V		980		pF
Output Capacitance	Coss	V _G S = 0 V		293		pF
Reverse Transfer Capacitance	Crss	f = 1 MHz		205		pF
Turn-on Delay Time	td(on)	V _{DD} = 10 V		86		ns
Rise Time	tr	lo = 3.0 A		247		ns
Turn-off Delay Time	t d(off)	V _{GS(on)} = 4.0 V		480		ns
Fall Time	t _f	$R_G = 10 \Omega$		659		ns
Total Gate Charge	Q _G	V _{DD} = 10 V		8.8		nC
Gate to Source Charge	Qgs	ID = 6.0 A		2.2		nC
Gate to Drain Charge	Q _{GD}	V _G S = 4.0 V		3.2		nC
Diode Forward Voltage	V _{F(S-D)}	IF = 6.0 A, VGS = 0 V		0.82		V
Reverse Recovery Time	trr	IF = 6.0 A, VGS = 0 V		44		ns
Reverse Recovery Charge	Qrr	di/dt = 15 A / μs		2.2		nC

TEST CIRCUIT 1 SWITCHING TIME

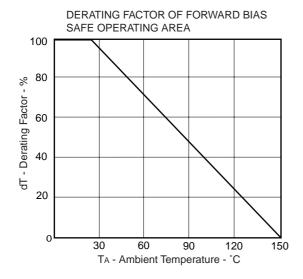
PG. $\bigcap_{RG} R_G = 10 \Omega$ $\tau = 1 \mu s$ Duty Cycle $\leq 1 \%$

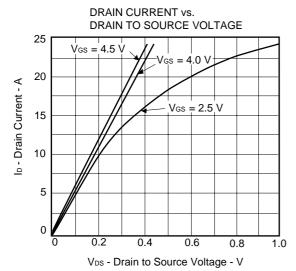
TEST CIRCUIT 2 GATE CHARGE

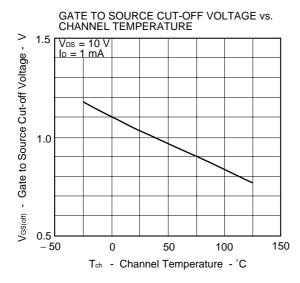


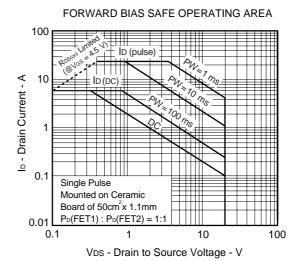


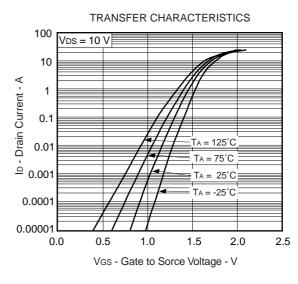
TYPICAL CHARACTERISTICS (TA = 25°C)

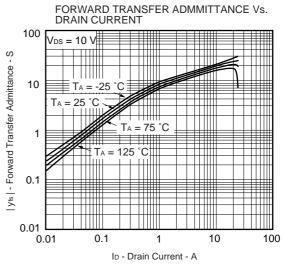






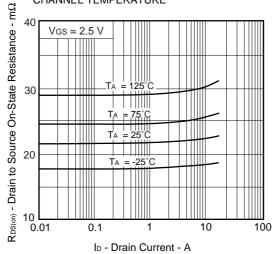




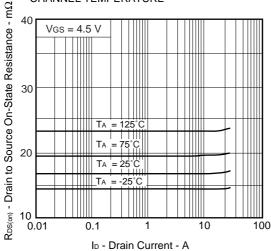


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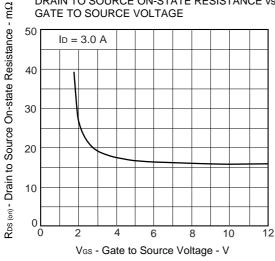
DRAIN TO SOURCE ON-STATE RESISTANCE vs. **CHANNEL TEMPERATURE**



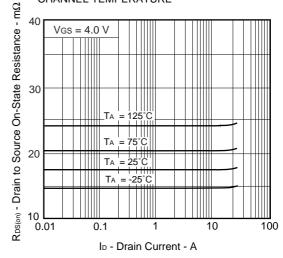
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



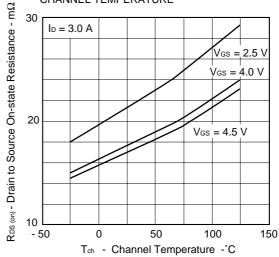
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



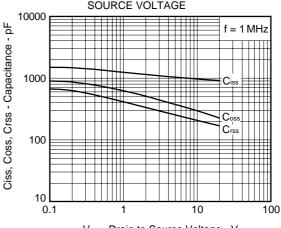
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



DRAIN TO SOURCE ON STATE RESISTANCE vs. CHANNEL TEMPERATURE

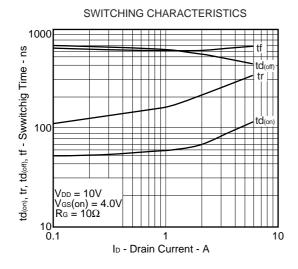


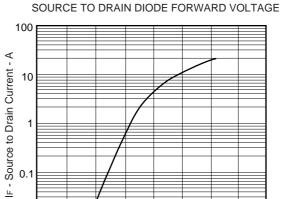
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE

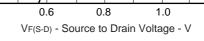


V_{DS} - Drain to Source Voltage - V

1.2

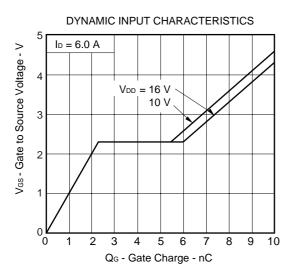


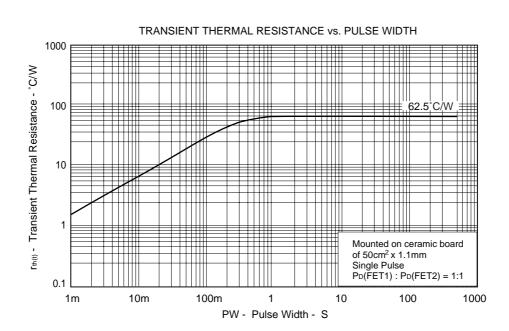




0.1

0.01 - 0.4





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NEC

 μ PA1855

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NEC μ PA1855

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